

FINAL REPORT

Microbiological Sampling Report

for

National Oceanic & Atmospheric Administration

Samplings Conducted on the Fifteenth Floor
of Building SSMC-3
on August 2, 2000

Interagency Agreement #: D8H00CO31200

Task: 9903

September 5, 2000

Prepared by
US Public Health Service
Division of Federal Occupational Health
Bethesda Central Office

Executive Summary

At the request of the National Oceanic & Atmospheric Administration (NOAA), Federal Occupational Health (FOH) conducted microbiological sampling in cubicles 15640, 15710, 15758, and 15872 of Building SSMC-3, located at 1315 East-West Highway, Silver Spring, Maryland. According to NOAA, the 15th floor of this building was cleaned during the weekend of July 28 – 30, 2000, and all carpeting was vacuumed in the evening of August 1, 2000. This requested sampling served as a post-cleaning sampling. On August 2, 2000, air (both Andersen[®] and Zefon[®]), swab, contact plate, and vacuum dust samples were collected as previous sampling conducted on May 30, 2000. Air samples were also collected from outdoors.

Findings are as follows:

- Indoor airborne fungal and spore levels were lower than those of outdoors. Basidiomycetes and their spores dominated outdoor fungal flora.
- The mean fungal level of contact plate samples collected from horizontal hard surfaces was significantly reduced after cleaning.
- Fungal levels on surfaces of supply diffusers and return troughers in light fixture ranged from below the detection limit of 3 CFU/in² to 35 CFU/in².
- Fungal levels in plenum, carpet, and furniture dust of these cubicles were at 10³ - 10⁴ CFU/g of fine

dust levels.

· Fungal levels in dust samples collected after cleaning were not statistically different from those collected before cleaning, regardless of sampling surfaces (carpet, furniture, or plenum).

INTRODUCTION

At the request of the National Oceanic & Atmospheric Administration (NOAA), Federal Occupational Health (FOH) conducted a microbiological sampling in cubicles 15640, 15710, 15758, and 15872 of Building SSMC-3, located at 1315 East-West Highway, Silver Spring, Maryland. According to NOAA, the 15th floor of this building was cleaned during the weekend of July 28 – 30, 2000, and all carpeting was vacuumed in the evening of August 1, 2000. This requested sampling served as a post-cleaning sampling. On August 2, 2000, air (both Andersen[®] and Zefon[®]), swab, contact plate, and vacuum dust samples were collected as previous sampling conducted on May 30, 2000. Air samples were also collected from outdoors.

EVALUATION METHODOLOGY

Air Samples

Various types of samples were collected from these cubicles on August 2, 2000. Two types of air samples were collected from each cubicle: (1) culturable method using Andersen[®] N-6 samplers at a flow rate of 28.3 L/min, and (2) non-culturable method using Zefon[®] Air-O-Cell cassettes at a flow rate of 15 L/min. Indoor Andersen[®] air samples were collected for 3 minutes and outdoor samples were collected for both one and three minutes. Two percent (2 %) malt extract agar (MEA) and cellulose Czapek agar (CCA) was used to recover general fungi and cellulose-loving fungi, respectively. Non-culturable air samples were collected at the aforementioned sampling locations. Indoor samples were collected for ten minutes and outdoor samples were collected for both five and ten minutes. Outdoor air samples were collected near the entrance of the building.

Contact Plate Samples

To determine fungal burden on horizontal surfaces of these cubicles, four contact plate samples were collected from each cubicle. Samples were collected from randomly selected horizontal surfaces.

Sampling was conducted by pressing the MEA-filled Rodac[®] plate against the surface of interest for five seconds. A total of 16 contact plate samples were collected.

Swab Samples

Swab samples were collected from surfaces of each supply diffusers and return troughers in each cubicle. They were collected by wiping a known area of surface with a sterile cotton swab (Culturette[®]) wetted with holding media. Approximately 5 in² area was wiped for return trougher and 4 in² for supply diffusers. The swab was then placed directly into its holder. Each holder was labeled with an identifiable number. A total of 16 swab samples were collected from these cubicles.

Vacuum Dust Samples

Dust accumulated on carpeting, chairs and fabric system furniture, and the plenum were collected with a High Efficiency Particulate Air (HEPA) vacuum attached with a special “sock” device. For each carpet sample, a 3-ft by 3-ft area was vacuumed for at least five minutes. Total surface areas of 9 ft² were vacuumed from system furniture and chairs, and composite as one sample. Dust accumulated above the ceiling plenum was also vacuumed and composite as one sample. One carpet sample, one composite furniture sample, and one composite plenum sample were collected from each cubicle.

All samples collected were sent for next morning delivery to FOH’s Environmental Microbiology Laboratory (EML) in Philadelphia, Pennsylvania for analysis.

Laboratory Procedures

Upon receipt, all Andersen[®] air and contact plate samples were incubated in a 25°C incubator. Each swab sample was suspended in sterile distilled water, diluted serially, and inoculated onto agar plates. Both MEA and CCA were used for retrieving fungi. At least three dilution series were used for each sample. Each vacuum dust sample was sieved through a 250 mm sieve. The fine dust (< 250 mm) retrieved was then weighed and followed the dilution plating for fungal analysis.

All plates were incubated in a 25°C incubator. They were examined every other day for up to 10 days to

ensure the full recovery of fungi. Fungal identification was based on colony morphology, spores and conidia formation. Total fungal colonies formed on each MEA plate and *Stachybotrys chartarum* on CCA plates were counted and recorded. Fungal levels in samples were presented as colony forming units (CFUs) per measuring unit. For example, CFU/m³ for Andersen[®] air samples, CFU/in² for swab samples, CFU/plate for contact plate samples, and CFU/g of fine dust for vacuum dust samples.

All Zefon[®] cassette samples were analyzed by the Environmental Microbiology Laboratory in Escondido, California for direct microscopic examination. Fungal spores were identified and their airborne levels were presented as spores/m³.

RESULTS AND DISCUSSION

Analytical results from FOH's EML are presented in Attachment A in a laboratory report #NOAA-00-49R. Results from microscopic examination of Zefon[®] cassette samples are presented in Attachment B.

Air Samples

Andersen Results

Outdoor airborne fungal levels were higher than those of indoors (Table 1). Basidiomycetes and *Cladosporium* dominated outdoor fungal flora, followed by *Alternaria* and *Aureobasidium*. *Stachybotrys chartarum* was not detected from these samples.

Zefon Results

Indoor fungal spore levels were much lower than those of outdoors (Table 1). Basidiospores dominated outdoor fungal flora with diverse fungal spore types, such as Ascospores, *Cladosporium*, and *Penicillium/Aspergillus* types. Fungal spores detected indoors were similar to those of outdoors. *Stachybotrys chartarum* was not detected from any sample collected.

Table 1. Fungal and spore levels in the air of different cubicles of the 15th floor in SSMC-3 on August 2, 2000.

Cubicles	15640	15710	15758	15872	Outdoors
Parameters					
Airborne Fungal Levels					294*
(CFU/m ³)	<12	<12	12	<12	353
Total Fungal Spores					29,552*
(Spores/m ³)	27	26	40	40	27,826

* Two samples were collected from outdoors.

Contact Plate Samples

Fungal levels ranged from below the detection limits of 1 CFU/plate to 11 CFU/plate. Basidiomycetes were the predominant fungal genera recovered, followed by *Cladosporium* and *Penicillium*. *Stachybotrys chartarum* was not detected from these samples.

A significant reduction of surface fungal burden after cleaning ($p = 0.009$) (Table 2) was detected from analysis of variance (ANOVA).

Table 2. Mean fungal levels (CFU/plate) on horizontal surfaces of various cubicles on the 15th floor of SSMC-3 on May 30, 2000 and August 2, 2000, by contact plating.

Cubicles	15640	15710	15758	15872
Sampling Dates				
May 30, 2000	14.5	6.3	18.3	13.8
August 2, 2000	4.0	4.8	4.3	3.3

Swab Samples

Fungal levels on surfaces of supply diffusers and return troughers in light fixture ranged from below the detection limits of 3 CFU/in² to 35 CFU/in². *Penicillium* was the predominant fungal genus recovered from these samples, followed by *Aspergillus niger*. *Stachybotrys chartarum* (2 CFU/in²) was detected from a swab sample collected from surfaces of a return trougher at cubicle 15872 (sample #W11).

Results from ANOVA indicated a significant increase of mean fungal burden on surfaces of supply diffusers and return troughers after cleaning ($p = 4.0 \times 10^{-6}$, 1 CFU/in² vs. 12 CFU/in²). Dust generated

during cleaning activities may have contributed to this increase of fungal burden.

Vacuum Dust Samples

Diverse fungal genera, such as *Alternaria*, *Aspergillus*, *Aureobasidium*, *Chaetomium*, *Cladosporium*, *Epicoccum*, *Nigrospora*, *Paecilomyces*, *Penicillium*, *Pithomyces*, *Rhizopus*, *Ulocladium*, and Basidiomycetes were recovered from these dust samples. Fungal levels in these fine dust samples collected were at 10^3 - 10^4 CFU/g of fine dust levels (Table 3).

Plenum Dust

Cladosporium and *Penicillium* were the predominant fungal genera detected from these samples. *Stachybotrys chartarum* was detected from cubicles 15640 and 15710. These results were not statistically different from those plenum dust samples collected on May 30, 2000 (Table 3).

Carpet Dust

Predominant fungi detected were *Cladosporium*, *Aureobasidium*, and *Penicillium*. *Stachybotrys chartarum* was detected on carpet dust collected from cubicle 15640 (Table 3). These results were not statistically different from those carpet dust samples collected on May 30, 2000 (Table 3).

Furniture Dust

Predominant fungi detected were *Cladosporium*, *Alternaria*, and *Penicillium*. *Stachybotrys chartarum* was not detected on these furniture dust samples (Table 3). These results were not statistically different from those furniture dust samples collected on May 30, 2000 (Table 3).

Table 3. Total fungal levels (CFU/g of fine dust) in fine dust collected from carpet, plenum, and furniture of cubicles 15640, 15710, 15758, and 15872 of SSMC-3, by vacuum dust sampling, collected on August 2, 2000.

Cubicles	15640	15710	15758	15872	<i>p-value</i> *
Plenum					
5/30/2000	8,800 (+@)	6,733 (+)	NA	66,667 (+)	0.445
8/2/2000	7,600 (+)	8,400 (+)	NA	6,800 (-)	
Carpet					
5/30/2000	3,168 (-)	4,752 (-)	3,200 (-)	11,200 (-)	0.331
8/2/2000	6,733 (+)	6,400 (-)	2,376 (-)	14,257 (-)	
Furniture					
5/30/2000	9,000 (+)	2,857 (-)	15,745 (+)	4,000 (-)	0.331
8/2/2000	42,857 (-)	5,833 (-)	6,250 (-)	13,053 (-)	

* Analysis of variance on data of 5/30/00 and 8/2/2000.

@ +: *Stachybotrys chartarum* was detected on MEA and/or CCA plates.

-: *Stachybotrys chartarum* was not detected on MEA and CCA plates.

CONCLUSIONS

- Indoor airborne fungal and spore levels were lower than those of outdoors. Basidiomycetes and their spores dominated outdoor fungal flora.
- The mean fungal level of contact plate samples collected from horizontal hard surfaces was significantly reduced after cleaning.
- Fungal levels on surfaces of supply diffusers and return troughers in light fixture ranged from

below the detection limit of 3 CFU/in² to 35 CFU/in².

- Fungal levels in plenum, carpet, and furniture dust of these cubicles were at 10³ - 10⁴ CFU/g of fine dust levels.
- Fungal levels in dust samples collected after cleaning were not statistically different from those collected before cleaning, regardless of sampling surfaces (carpet, furniture, or plenum).

RECOMMENDATIONS

- Wet wipe surfaces of return troughers at cubicle 15872.
- Conduct any above ceiling plenum work after hour. Thoroughly HEPA vacuum the surrounding areas afterwards.
- Implement an emergency water intrusion protocol for this building to adequately manage any unexpected water intrusion in order to prevent fungal proliferation.

ATTACHMENT A

Microbiological laboratory report for samples collected
from the 15th floor of SSMC-3, on August 2, 2000.

ATTACHMENT B

Results from microscopic examination of Zefon air samples collected
from the 15th floor of SSMC-3, on August 2, 2000.

LABORATORY REPORT #NOAA-00-49R

**Client agency: National Oceanic and Atmospheric Administration,
Silver Spring, MD**

POIS#/task #: D8H00CO31200 / 9903

Sampling date: 8/2/00

Dates of inoculation: 8/2/00 (airs and contact plates), 8/3/00 (wipes), and 8/4/00 (dust)

General locations: SSMC-3, Silver Spring, MD

Specific locations: 15th floor

Sampling techniques: Air (Andersen N-6 sampler), contact plate, wipe, and vacuum dust samplings

Medium used: Malt extract agar (MEA) and cellulose Czapek agar (CCA) for fungi

Samples submitted by: J. Sobelman

Date characterization completed: 8/14/00

(A) Air samples on MEA and CCA plates

Sample ID	Sampling Location	Air Volume (L)	Fungi on MEA @ 25°C	Presence of <i>Stachybotrys chartarum</i>*** on CCA @ 25° C
OA1	Outside bldg.	84.9	1. <i>Cladosporium</i> (6*) 2. <i>Alternaria</i> (2) 3. <i>Aureobasidium</i> (2) 4. <i>Aspergillus sp.</i> (1) 5. <i>Penicillium</i> (1) 6. Basidiomycetes (13) CFU/m ³ = 294	No

OA2	Outside bldg.	28.3	1. <i>Alternaria</i> (2) 2. <i>Cladosporium</i> (1) 3. <i>Nigrospora</i> (1) 4. Basidiomycetes (6) CFU/m ³ = 353	No
A1	15 th floor, room 15640	84.9	No fungal growth CFU/m ³ < 12	No
A2	15 th floor, room 15872	84.9	No fungal growth CFU/m ³ < 12	No

Sample ID	Sampling Location	Air Volume (L)	Fungi on MEA @ 25°C	Presence of <i>Stachybotrys chartarum</i> *** on CCA @ 25° C
A3	15 th floor, room 15710	84.9	No fungal growth CFU/m ³ < 12	No
A4	15 th floor, room 15758	84.9	1. <i>Aureobasidium</i> (1) CFU/m ³ = 12	No
SB	Ship blank	NA [#]	No fungal growth	No

(B) Contact plate samples on MEA plates

Sample ID	Sampling Location	Fungi detected on MEA @ 25°C
CP1	Room 15640, top of small file cabinet	1. <i>Cladosporium</i> (1) 2. <i>Penicillium</i> (1) 3. Basidiomycetes (3) CFU/plate = 5

CP2	Room 15640, top of computer	1. <i>Aspergillus sp.</i> (1) 2. <i>Cladosporium</i> (1) 3. <i>Penicillium</i> (1) 4. Basidiomycetes (1) CFU/plate = 4
CP3	Room 15640, top of shelf	1. <i>Aureobasidium</i> (2) 2. <i>Cladosporium</i> (1) CFU/plate = 3
CP4	Room 15640, top of system furniture	1. <i>Paecilomyces</i> (1) 2. <i>Penicillium</i> (1) 3. Basidiomycetes (2) CFU/plate = 4
CP5	Room 15872, top of system furniture	1. <i>Cladosporium</i> (2) 2. Basidiomycetes (2) CFU/plate = 4

Sample ID	Sampling Location	Fungi detected on MEA @ 25°C
CP6	Room 15872, window ledge	1. <i>Aspergillus sp.</i> (1) 2. Basidiomycetes (3) CFU/plate = 4
CP7	Room 15872, small file cabinet with furniture	1. <i>Penicillium</i> (1) 2. <i>Rhizopus</i> (1) CFU/plate = 2
CP8	Room 15872, desk near phone	1. <i>Cladosporium</i> (1) 2. Basidiomycetes (2) CFU/plate = 3
CP9	Room 15710, top of system furniture	1. Basidiomycetes (1) CFU/plate = 1

CP10	Room 15710, top of printer	1. <i>Aspergillus sp.</i> (3) 2. <i>Cladosporium</i> (1) 3. <i>Paecilomyces</i> (1) 4. Basidiomycetes (1) CFU/plate = 6
CP11	Room 15710, top of table near printer	1. Basidiomycetes (1) CFU/plate = 1
CP12	Room 15710, top of table opposite printer	1. <i>Aspergillus sp.</i> (7) 2. <i>Alternaria</i> (1) 3. <i>Aspergillus versicolor</i> *** (1) 4. <i>Penicillium</i> (1) 5. Basidiomycetes (1) CFU/plate = 11
CP13	Room 15758, desk	No fungal growth CFU/plate < 1
CP14	Room 15758, top of system furniture	1. <i>Cladosporium</i> (4) 2. <i>Alternaria</i> (1) 3. <i>Aureobasidium</i> (1) 4. <i>Penicillium</i> (1) CFU/plate = 7

Sample ID	Sampling Location	Fungi detected on MEA @ 25°C
CP15	Room 15758, top shelf	1. <i>Cladosporium</i> (1) 2. <i>Paecilomyces</i> (1) 3. Basidiomycetes (1) CFU/plate = 3

CP16	Room 15758, top of computer	1. <i>Penicillium</i> (2) 2. <i>Alternaria</i> (1) 3. <i>Aspergillus sp.</i> (1) 4. <i>Aspergillus versicolor</i> *** (1) 5. <i>Cladosporium</i> (1) 6. <i>Paecilomyces</i> (1) CFU/plate = 7
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(C) Wipe samples on MEA and CCA plates

Sample ID	Sampling Location	Area (in ²)	Dilution factor	Fungi on MEA @ 25°C	Presence of <i>Stachybotrys chartarum</i> *** on CCA @ 25°C
LC	Lab control	NA#	10X-MEA 10X-CCA	No fungal growth	No
W1	Room 15640, supply (prev. W27)	4	10X-MEA 10X-CCA	1. <i>Penicillium</i> (5) 2. <i>Cladosporium</i> (1) CFU/in ² = 15	No
W2	Room 15640, supply (prev. W28)	4	10X-MEA 10X-CCA	1. <i>Penicillium</i> (10) 2. <i>Aureobasidium</i> (2) 3. <i>Aspergillus niger</i> ** (1) 4. <i>Cladosporium</i> (1) CFU/in ² = 35	No

Sample ID	Sampling Location	Area (in ²)	Dilution factor	Fungi on MEA @ 25°C	Presence of <i>Stachybotrys chartarum</i> *** on CCA @ 25°C

W3	Room 15640, return (prev. W29)	5	10X-MEA 10X-CCA	1. <i>Penicillium</i> (9) 2. <i>Aureobasidium</i> (4) 3. <i>Alternaria</i> (1) 4. <i>Cladosporium</i> (1) CFU/in ² = 30	No
W4	Room 15640, return (prev. W30)	5	10X-MEA 10X-CCA	1. <i>Aureobasidium</i> (2) 2. <i>Cladosporium</i> (1) 3. <i>Penicillium</i> (1) CFU/in ² = 8	No
W5	Room 15872, supply (prev. W12)	4	10X-MEA 10X-CCA	1. <i>Penicillium</i> (4) 2. <i>Aspergillus sp.</i> (1) CFU/in ² = 13	No
W6	Room 15872, supply (prev. W13)	4	10X-MEA 10X-CCA	1. <i>Penicillium</i> (7) 2. <i>Rhizopus</i> (1) CFU/in ² = 20	No
W7	Room 15872, supply (prev. W14)	4	10X-MEA 10X-CCA	1. <i>Penicillium</i> (2) CFU/in ² = 5	No
W8	Room 15872, supply (prev. W15)	4	10X-MEA 10X-CCA	1. <i>Penicillium</i> (4) 2. <i>Aspergillus sp.</i> (2) CFU/in ² = 15	No
W9	Room 15872, supply (prev. W16)	4	10X-MEA 10X-CCA	1. <i>Penicillium</i> (1) CFU/in ² = 3	No
W10	Room 15872, supply (prev. W17)	4	10X-MEA 10X-CCA	1. <i>Penicillium</i> (6) 2. <i>Aspergillus niger</i> ** (1) CFU/in ² = 18	No
W11	Room 15872, return (prev. W20)	5	10X-MEA 10X-CCA	1. <i>Aspergillus sp.</i> (1) CFU/in ² = 2	Yes (1) CFU/in ² = 2
W12	Room 15872, return (prev. W19)	5	10X-MEA 10X-CCA	1. <i>Cladosporium</i> (1) CFU/in ² = 2	No

Sample ID	Sampling Location	Area (in ²)	Dilution factor	Fungi on MEA @ 25°C	Presence of <i>Stachybotrys chartarum</i> *** on CCA @ 25° C
W13	Room 15872, return (prev. W18)	5	10X-MEA 10X-CCA	1. <i>Penicillium</i> (6) 2. <i>Aspergillus niger</i> ** (1) 3. <i>Cladosporium</i> (1) CFU/in ² = 16	No
W14	Room 15710, return (prev. W22)	5	10X-MEA 10X-CCA	No fungal growth CFU/ in ² < 2	No
W15	Room 15710, return (prev. W21)	5	10X-MEA 10X-CCA	1. <i>Aspergillus niger</i> ** (2) CFU/in ² = 4	No
W16	Room 15758, return (prev. W11)	5	10X-MEA 10X-CCA	1. <i>Penicillium</i> (4) CFU/in ² = 8	No

(D) Vacuum dust samples on MEA and CCA plates

Sample ID	Sampling Location	Weight (g)	Dilution factor	Fungi on MEA @ 25°C	Presence of <i>Stachybotrys chartarum</i> *** on CCA @ 25° C
V01	Room 15758, carpet	0.101	40X-MEA 10X-CCA	1. <i>Alternaria</i> (2) 2. <i>Cladosporium</i> (2) 3. <i>Aspergillus sp.</i> (1) 4. <i>Aureobasidium</i> (1) CFU/g = 2,376	No

Sample ID	Sampling Location	Weight (g)	Dilution factor	Fungi on MEA @ 25°C	Presence of <i>Stachybotrys chartarum</i> *** on CCA @ 25° C

V02	Room 15758, furniture	0.064 ^{##}	40X-MEA 10X-CCA	1. <i>Alternaria</i> (7) 2. <i>Aureobasidium</i> (2) 3. <i>Cladosporium</i> (2) 4. <i>Epicoccum</i> (2) 5. <i>Penicillium</i> (2) 6. <i>Aspergillus niger</i> ** (1) 7. <i>Chaetomium</i> (1) 8. <i>Nigrospora</i> (1) 9. Ascomycetes (1) 10. Basidiomycetes (1) CFU/g = 6,250	No
V04	Room 15710, carpet	0.100	40X-MEA 10X-CCA	1. <i>Aureobasidium</i> (14) 2. Ascomycetes (2) CFU/g = 6,400	No
V05	Room 15710, furniture	0.048 ^{##}	40X-MEA 10X-CCA	1. <i>Penicillium</i> (8) 2. <i>Alternaria</i> (3) 3. <i>Cladosporium</i> (2) 4. <i>Aspergillus niger</i> ** (1) CFU/g = 5,833	No
V06	Room 15710, ceiling	0.100	40X-MEA 40X-CCA	1. <i>Penicillium</i> (15) 2. <i>Cladosporium</i> (3) 3. <i>Aspergillus sp.</i> (1) 4. Basidiomycetes (2) CFU/g = 8,400	Yes (1) CFU/g = 400

Sample ID	Sampling Location	Weight (g)	Dilution factor	Fungi on MEA @ 25°C	Presence of <i>Stachybotrys chartarum</i> *** on CCA @ 25° C

V07	Room 15640, carpet	0.101	40X-MEA 10X-CCA	1. <i>Alternaria</i> (5) 2. <i>Penicillium</i> (5) 3. <i>Aspergillus sp.</i> (2) 4. <i>Aureobasidium</i> (2) 5. <i>Cladosporium</i> (2) 6. <i>Aspergillus niger</i> ** (1) CFU/g = 6,733	Yes (5) CFU/g = 495
V08	Room 15640, furniture	0.098 ^{##}	400X-MEA 10X-CCA	1. <i>Cladosporium</i> (9) 2. <i>Alternaria</i> (3) 3. <i>Aureobasidium</i> (3) 4. <i>Penicillium</i> (3) 5. <i>Aspergillus versicolor</i> *** (1) 6. <i>Epicoccum</i> (1) 7. <i>Rhizopus</i> (1) CFU/g = 4.3×10^4	No
V09	Room 15640, ceiling	0.100	40X-MEA 10X-CCA	1. <i>Penicillium</i> (11) 2. <i>Cladosporium</i> (5) 3. <i>Aspergillus sp.</i> (1) 4. Basidiomycetes (2) CFU/g = 7,600	Yes (1) CFU/g = 100

Sample ID	Sampling Location	Weight (g)	Dilution factor	Fungi on MEA @ 25°C	Presence of <i>Stachybotrys chartarum</i> *** on CCA @ 25° C

V10	Room 15872, carpet	0.101	40X-MEA 10X-CCA	1. <i>Ulocladium</i> (19) 2. <i>Penicillium</i> (5) 3. <i>Alternaria</i> (4) 4. <i>Cladosporium</i> (2) 5. <i>Aspergillus sp.</i> (1) 6. <i>Nigrospora</i> (1) 7. <i>Paecilomyces</i> (1) 8. <i>Rhizopus</i> (1) 9. sterile fungi (2) CFU/g = 1.4×10^4	No
V11	Room 15872, ceiling	0.100	40X-MEA 10X-CCA	1. <i>Penicillium</i> (15) 2. <i>Cladosporium</i> (2) CFU/g = 6,800	No
V12	Room 15872, furniture	0.095##	40X-MEA 10X-CCA	1. <i>Cladosporium</i> (22) 2. <i>Aureobasidium</i> (19) 3. <i>Alternaria</i> (9) 4. <i>Penicillium</i> (7) 5. <i>Epicoccum</i> (3) 6. <i>Chaetomium</i> (1) 7. <i>Nigrospora</i> (1) CFU/g = 1.3×10^4	No

* Colony counts. ** Opportunistic fungi. *** Toxigenic fungi. # Not applicable.

5ml of sterilized distilled water were added instead of 10ml.

Characterization completed by: _____

Ling-Ling Hung, Ph.D. Microbiologist

Quality control checked by: _____ (initials)